



Faculty of Engineering & Technology
Third Semester B.E. (Computer Technology)
(C.B.S.) Examination

DIGITAL ELECTRONICS & MICROPROCESSOR

Time : Three Hours]

[Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry marks as indicated.
- (2) Answer **SIX** questions .
- (3) Due credit will be given to neatness and adequate dimensions.
- (4) Assume suitable data wherever necessary.
- (5) Illustrate your answers wherever necessary with the help of neat sketches.

1. (a) Simplify the following function :

$$(i) Y = \overline{(\overline{A + A + B})(\overline{B + B + C})}$$

$$(ii) Y = A B \overline{C} + A \overline{B} \overline{C} + \overline{A} B C + A B C + A \overline{B} C$$

7

(b) Solve the following :—

$$(i) (23)_{10} = (212)_x, \text{ find base } x.$$

$$(ii) (9.25)_{10} = ()_2 = ()_8 = ()_{16}$$

6

OR

2. (a) $F = ABC + B\bar{C}D + \bar{A}BC$
Given the logic equation
(i) Make a truth table
(ii) Simplify using K-MAP
(iii) Realize using NAND gates only. 8
- (b) Realize $Y = A + B\bar{C}D$ using 2 input NAND gates only. 5
3. (a) Design BCD to Excess-3 code convertor using logic gates. 7
- (b) (i) Design a 8:3 encoder using logic gates.
(ii) Implement the following Boolean function using 3:8 decoder and gates :
 $F_1(A, B, C) = \sum m(1, 3, 7)$
 $F_2(A, B, C) = \sum m(0, 2, 4, 5, 6)$. 7

OR

4. (a) Convert the following flip flops :
(i) JK to T
(ii) D to JK. 8
- (b) What is a latch and how a latch can be used as 1-bit memory cell ? 3
- (c) What is preset and clear input of a flip flop ? 3
5. (a) Design a MOD-6 counter using T flip flop. 7

- (b) Explain the difference between asynchronous and synchronous counter 3
- (c) Explain lock free counters and their needs. 3

OR

- 6. (a) Design full subtractor using two half subtractors and logic gate 7
- (b) Explain carry look ahead adder with suitable diagram. 6
- 7. (a) Explain various flags of 8085 with suitable example. 7
- (b) Explain the following pins :
 - (i) ALE
 - (ii) RESET IN
 - (iii) $\overline{IO/M}$
 - (iv) \overline{SID} 7

OR

- 8. (a) Explain the following instructions of 8085 :
 - (i) STAX D
 - (ii) XCHG
 - (iii) XRA B
 - (iv) MVI M, data. 8
- (b) What are the different registers of 8085 ? Discuss their functions. 6

9. (a) Explain the different addressing modes supported by 8085 with examples. 6
- (b) Draw the timing diagram of the following instruction :
- (i) LXI H, 7000 H
- (ii) LHLD 7000 H 7

OR

10. (a) Discuss in brief about assemblers and disassemblers. 6
- (b) Write an ALP to add two 16 bit data 7060 H and 8010 H. 4
- (c) What do you mean by sub-routine ? What are the advantages of using sub-routine ? 3
11. (a) If operating frequency = 1.728 MHz, write a delay programme for 100 ms. 6
- (b) Explain with examples the EI and DI instructions of 8085. How these instructions are generally used ? 7

OR

12. (a) Explain the SIM and RIM instructions. 6
- (b) Explain any three advanced instructions of μ p 8085. 7